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TO ASSIST THOSE WHO MAKE DECISIONS RELATING TO EDUCATIONAL PROGRAMS IN AGRICULTURE, RECENT RESEARCH IN VOCATIONAL AGRICULTURE IS SUMMARIZED. A 1963 STUDY TREATS THE RELATIONSHIP BETWEEN WORK EXPERIENCE AND STUDENT CHARACTERISTICS, PLANS, AND ASPIRATIONS. STUDIES ON POST-SECONDARY EDUCATION CONCERN GUIDELINES FOR TECHNICIAN PROGRAMS, JUSTIFICATION FOR A JUNIOR COLLEGE PROGRAM, BACKGROUND IN VOCATIONAL AGRICULTURE RELATED TO SUCCESS IN COLLEGE, AND CHARACTERISTICS OF COLLEGE OF AGRICULTURE STUDENTS. STUDENT FOLLOWUP STUDIES TREAT EMPLOYMENT OPPORTUNITIES IN AGRICULTURE, VALUE OF VOCATIONAL AGRICULTURE IN OCCUPATIONS, AND OCCUPATIONAL STATUS OF FORMER VOCATIONAL AGRICULTURE STUDENTS. AGRI-BUSINESS STUDIES TREAT DETERMINATION OF EMPLOYMENT OPPORTUNITIES AND IDENTIFICATION OF TECHNICAL WORKERS IN AGRICULTURE AND THEIR NEEDS FOR TRAINING PROGRAMS. STUDIES ON AGRICULTURAL EDUCATION FOR ADULTS TREAT ORGANIZATION OF AGRICULTURE IN RELATION TO FARMER'S SOCIO-ECONOMIC VALUES TO CROP YIELD, FACTORS ASSOCIATED WITH SUCCESS IN ADULT FARMER EDUCATION, AND EDUCATION OF MIGRANT CHILDREN. (JM)

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RESEARCH SUMMARIES

RESEARCH COORDINATING UNIT

•Vocational Education Section•

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Vocational Agriculture

CALIFORNIA STATE DEPARTMENT OF EDUCATION
MAX RAFFERTY - Superintendent of Public Instruction
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Vocational Agriculture

Prepared by

Research Coordinating Unit
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DIVISION OF INSTRUCTION

PREFACE

For the past several years, major changes have been made in the curriculum for vocational agriculture. It has been necessary to make these changes because fewer but more highly skilled persons have been needed to produce agricultural products on the farm, and a rapidly growing number of skilled workers have been needed to fill positions in off-farm agricultural industries. Many of the curriculum changes that have taken place are the result of the research in agricultural education. We are hopeful that this publication, which summarizes some of the recent research in vocational agriculture, will be helpful to those who have responsibility for making decisions relating to the educational programs in agriculture.

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INSTRUCTOR AND INSTRUCTIONAL AIDS

A study was made in 1963 to determine relationships existing between five selected measures of work experience engaged in by high school students of vocational agriculture and selected student characteristics, occupational plans and aspirations, and educational plans and aspirations. The five selected measures of work experience were: 1) hours of farm work experience, 2) hours of farm work experience with owned project, 3) composite farm work experience score, 4) hours of off-farm work experience, and 5) total hours of work experience. Five student characteristics: 1) class in high school, 2) place of residence, 3) farm operation by father, 4) farming status of father, and 5) size of farm, were each found to be significantly related to a majority of five measures of work experience. Occupations into which the 421 students in the study indicated that they were most apt to enter were: farming, chosen by 110 students; non-farm agricultural occupations, chosen by 45 students; non-agricultural occupations, chosen by 156 students; and 110 students indicated no occupational choice. Positive relationships were found between a majority of the five measures of work experience used and, 1) choice between agricultural and non-agricultural occupations, 2) choice between farming and non-farming agricultural occupations, 3) certainty of occupational choice, and 4) occupational level of aspiration. Increased amounts of farm work experience and decreased amounts of off-farm work experience were related to choice of agriculture in preference to non-agricultural occupations.

One conclusion reached was that consideration needs to be given to meeting effectively the individual needs in agricultural education of students of varying backgrounds, opportunities, and interests. (Judge, 1963).

POST-SECONDARY TRAINING AND EDUCATION

In 1965, a study of post-secondary training programs was made to determine the status and characteristics of existing training programs for agricultural technicians and to determine the degree of emphasis administrators of present programs believe should be given to certain procedures in developing successful training programs. An additional purpose of the study was to synthesize, refine, and evaluate a tentative set of guidelines for use in planning and conducting training programs for agricultural technicians. Guidelines and supporting statements were synthesized, refined, and evaluated in the following areas: 1) objectives of the program, 2) types of programs offered, 3) curriculum content, 4) recruitment, 5) student services (selection, counseling, placement, follow-up, and residence facilities), 6) library, 7) instructional staff, 8) facilities and equipment, 9) acceptance by industry, business, and educational leaders, 10) evaluation, 11) accreditation and/or licensing, and 12) location. (Clary, 1965).

A study was made by Tarone (1959) to determine whether or not a justifiable need exists in the Coachella Valley Junior College District for instruction in agriculture, including farming and its related occupations. Conclusions indicated that there was no need for a comprehensive program in agriculture, but that there was a need for a compact, well-directed program in that field.

A study was made by Beeks (1964) to determine the knowledge of agronomy possessed by entering freshmen in the college of Agriculture at the University of Missouri. A testing instrument was constructed, consisting of 100 multiple choice items with four alternatives each and administered to 310 students in a required agriculture course during 1962 and 1963. The following findings resulted:

1. Students with more than one year of vocational agriculture were better prepared in agronomy than those students without such experience.
2. Students with more than one year of 4H experience were better prepared in soils but not necessarily better prepared in field crops.
3. Students who had lived on a farm for more than two years were better prepared in agronomy than students without this experience.
4. Students with experience in vocational agriculture but no 4H experience were better prepared in agronomy than students with 4H experience but no vocational agriculture.
5. Students with any one of the experiences in agriculture were better prepared in agronomy than students with no experience in agriculture.
6. About 48 per cent of the former students of vocational agriculture scored above 70 per cent on a constructed testing instrument. Nine per cent of non-vocational agriculture groups scored above 70 per cent.
7. Thirty-eight per cent of those students with farm experience scored above 70 per cent on the test instrument compared to about six per cent of the non-farm group.

8. Students without agricultural experience had significantly higher mean scores on the School and College Ability Test than those with agricultural experience.

Bentley (1963) investigated the influence of selected factors on the vocational choices of freshmen agriculture college students in seven Middle Western universities. Persons influencing the largest percentage of freshmen were: fathers, mothers, teachers of agriculture, and friends. Significantly more freshmen were influenced by teachers of agriculture than any other professional person.

Seven factors influencing most freshmen with respect to their choice of agriculture as a career were: 1) experience in farming, 2) want to work with farm people, 3) want to live on a farm, 4) work with livestock, 5) fathers, 6) work with farm crops, and 7) opportunity for employment.

In general, the more experience agriculture college freshmen had in vocational agriculture, FFA, and 4H Club, the more they attributed vocational choice influence to teachers of vocational agriculture, FFA, and 4H Clubs.

Opportunity factors selected by more than 40 per cent of the freshmen as one of the five most important factors in a job, in order of importance, were as follows: 1) to earn money, 2) to use your own ideas, 3) for continuous employment, 4) to be your own boss, 5) to do a variety of work, 6) to do good for others, and 7) for advancement. Very few indicated the following: 1) fame, 2) clean working conditions, 3) prestige, 4) travel, and 5) positions of authority, among the five most important factors in a job.

A California study by Thompson and Gordon (1964) was intended to determine if commitment to the college of

agriculture and other student characteristics is related to such factors as changes in major in college, scholastic record, or withdrawal from college. One hundred and ninety-six freshmen students in the college of agriculture completed a questionnaire in 1960, and completed a similar questionnaire as seniors. Those who were no longer in residence as students (72) completed a separate follow-up questionnaire. Findings indicated that:

1) The student who was committed to agriculture as a freshman was more likely to remain in agriculture and less likely to withdraw from college than was the uncommitted student. This was particularly true among males.
2) Only one-fourth of the students remained in the major in which they originally enrolled.
3) The group had a typical California family. About 40 per cent had fathers who were four-year college graduates; average family income was almost twice the average found in the 1960 census; and the fathers were predominantly Republican in a Democratic-majority state.
4) Potentially up to 90 per cent of this sample could receive four-year college degrees, as 62.5 were enrolled as seniors and of those who had withdrawn, most were enrolled in college elsewhere or planned to re-enter college.

In 1964, a study was made (Bronson) to evaluate the major aspects of programs of agricultural education in the inter-regional land-grant institutions of the United States. The following conclusions resulted:

1) There was general agreement among the head teacher trainers with respect to the major objectives of the agricultural education programs relative to recruiting trainees, the training curriculum, placement of teachers, "in-service" teacher education, research, administration and supervision, the staff, instruction, institutional facilities, and public relations activities.
2) There was essentially no difference in the objectives of the inter-regional land-grant departments and those of the regional land-grant departments.
3) The weakest areas in the total program of the agricultural education departments were research, recruiting trainees, and public relations activities.
4) The strongest areas of the total program were the staff, the training curriculum, and institutional facilities.
5) Racial segregation constituted a serious limitation to the implementation of the major objectives of inter-regional land-grant departments of agricultural education.

STUDENT FOLLOW-UP

A study was made to determine the number and kinds of positions and opportunities for employment in agriculture in Jefferson County, Oregon, and to develop guidelines for a post-high school agricultural education program. Questionnaires were sent to a random sampling of 125 students who had graduated from the high schools in the county between 1959 and 1963. It was found that about 75 per cent of the working force was engaged in agricultural occupations.

Forty-five per cent of the sample had no further training, five per cent were in the military service, and twelve per cent of these students had one year of training beyond high school. The study indicated a need for post-high school education, a large portion of which should be in the field of agriculture. (Skeans, 1964).

A study was made to determine the value of vocational agriculture and the occupational status of the male graduates from the high schools in Jones County, Texas. (Stenholm, 1962). Ratings made by 148 graduates pertaining to the importance of various high school courses to them in their occupations were as follows: 1) 91.9 per cent mathematics, 2) 88.5 per cent English grammar; 3) 78.3 per cent business and bookkeeping, 4) 66.7 per cent typing; 5) 62.7 per cent science, 6) 52.9 per cent foreign languages, 7) 42.3 per cent vocational agriculture; 8) 41.9 per cent history, and 38.5 per cent English literature. Thirty-nine and nine-tenths per cent of the 148 graduates received bachelor's degrees, 6.8 per cent master's degrees; and 2.7 per cent doctoral degrees.

A study to evaluate the present program of vocational agriculture in Oklahoma high schools by determining the occupational status of graduates was made by Hill (1964). Considering the state as a whole, it was found that 18.16 per cent of the graduates were farming. Ten and nine-tenths were working in off-farm agricultural occupations, and 12.3 per cent were enrolled in agricultural colleges (with a total of 41 per cent in some phase of agriculture).

The type of residence background a graduate had is apparently quite determinative of his future agricultural relationship. Those with a background of "country farm" had

by far the largest percentage entering farming, and also in off-farm agricultural occupations. Ranking next was the group with the "town non-farming" background. The "country non-farm" was the lowest group agriculturally.

Eggenberger (1963), made a study to consider various factors of former vocational agricultural students with present occupations. Findings showed 28.4 per cent (240) of the graduates were farm operators, 15.7 per cent (133) were employed in farm-related occupations, 59.5 per cent (419) had entered non-agricultural occupations, and 6.4 per cent (54) were in the military service. Approximately three-fifths of the 846 graduates had attended college. One-half of those who had attended college had received a degree. The graduates, not classified by occupation, rated the high school course areas in the following descending order of importance: mathematics, English, business and bookkeeping, speech, vocational agriculture, science, industrial arts, typing, and foreign language. The farm operators rated vocational agriculture second, and those graduates in farm-related occupations rated vocational agriculture fourth. The supervised farming program was rated "important" to the farm operators and those in farm-related occupations, but of "little importance" to those in non-agricultural occupations.

A study to determine the present occupational status of former students at Beaver High School (Utah) was made by Farrer (1964). Information was obtained on 333 students. Of these, 74 (22.2%) were engaged in full-time farming. Fifty-eight (17.4%) were in part-time farming; 6.6 per cent were in professional agriculture occupations; and 5.7 per cent were in off-farm agriculture occupations. The

agricultural and farming occupations included 53.75 per cent of the former students.

A study was made to identify the off-farm agricultural jobs and employment opportunities in three Utah counties. (Olsen, 1965). The total work force for the area was 54,600 persons employed and 3,800 persons unemployed. There were 3,538 persons employed in the off-farm agricultural occupations. Of this number, 1,522 were part-time employees, most of whom worked in food canning plants. Among those employed in off-farm agricultural occupations, there was an annual turnover of 1,090 persons. Employers estimated that within five years, they would need an additional 436 workers.

A study by John Williams (1965) was made to learn more about the students who enrolled as freshmen in the college of Agriculture in Arizona. Only slightly more than one-fourth of these former freshmen had decided on their field of vocational specialization before enrolling in the college, and almost one-fourth had still not decided by the time they had completed college. Factors that influenced these students to select their field of specialization were work-experience, parents' desire for approval and, availability of job.

Almost 42 per cent of all freshmen who enrolled graduated from the college. More than one-half of the students surveyed reported that they had taken additional technical or professional training since leaving the college.

Almost three-fourths of the students went into agricultural occupations, but only 52 per cent were employed in jobs associated with their major fields of study in college. More than one-fourth earned an income in excess of $12,500

per year, while only 8 per cent received earnings of less than $5,000 annually.

More than one-half indicated that they believed the curriculum they followed in the college prepared them "very well" or "fairly well" for the responsibilities of their present occupation. However, more than one-third of the group suggested that the curriculum should include more units in technical subject matter, economics, practical experience in production agriculture, and English and speech.

Williams (1964) also did a study to determine the effectiveness of the Arizona program of instruction in vocational agriculture in meeting the needs of students. A questionnaire was sent to former students in that field. More than 95 per cent had attended some kind of post-high school educational institution. Fifty-two per cent had attended a college or a university; 17.6 per cent had attended a junior college; 9.5 per cent had attended a technical-vocational school; and 16.4 per cent had attended a variety of other schools. They indicated that the vocational agriculture program was more useful in helping them to develop the ability to work harmoniously with others, to exercise leadership, and to perform farm mechanic skills effectively. It was least beneficial in helping them develop the ability to study effectively.

A study was done in Virginia by Campbell (1963) to determine the occupational status of former high school graduates who had completed one or more years of vocational agriculture. Of the 9,792 subjects included in the study, 62.09 per cent were employed in some phase of agriculture or were employed in other occupations related directly to the mechanical training they received in vocational

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agriculture. Only 0.7 per cent of those who studied vocational agriculture for four years were unemployed. Between 2,500 and 3,000 boys who had studied vocational agriculture one or more years were leaving high school each year in Virginia. About two-thirds of this number completed the four-year course. It was estimated that there would be an annual replacement need in Virginia by 1970 of about 2,100 trained farmer operators and farm workers. An additional 1,500 trained workers would be needed for annual replacement in non-farm but farm-related occupations, or a combined total of 3,600. There was a need for enrolling more high school students in vocational agriculture to meet this need. There was also a need for expanding post-high school training in vocational agriculture.

AGRI-BUSINESS

A study was made to determine the number and kinds of positions in agricultural business that seemed to require agricultural training. (Sutherland and Thompson, 1957). Major findings were as follows:

1) The most common types of business employing agriculturally trained people were those engaged in sales and service of agricultural products and farm supplies.
2) About 20 per cent of the 24,305 persons employed by the companies needed agricultural training.
3) More than 1,400 new employees trained in agriculture will be needed in the near future to fill anticipated new positions in the companies.
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5) Agricultural training of high schools was adequate for a large portion of skilled and semi-skilled positions, while more advanced training was needed for sales positions. It was felt that for consultants, supervisors, and managers, agricultural college was almost a requirement.

6) It appeared that most companies obtaining new employees hired them from another company.

A study was conducted to identify technical workers in California agriculture and their needs for training programs. The following were findings of the study:

1) More than 85 per cent of all work activity by technicians was in general fields of work other than in farming and ranching.

2) About 50 per cent more work activity was found to be engaged in by technicians in the field of agriculture services as by technicians in any other general field.

3) Workers were found to be engaged in the five general fields: agricultural services, agricultural industry, agricultural research, agricultural business, and farming.

4) Participation in many different activities is evidenced by technicians being engaged in 134 of the 165 possible entries.

5) A need was indicated for training in basic mechanical skills for about two-fifths of all technicians' positions reported. (Halterman, 1965).

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A study was undertaken (Bailey, 1965) to appraise the non-farm agricultural employment in West Virginia and to provide a basis for projecting agricultural education

programs to serve this sector of the labor force. Findings were as follows:

1) Interviews revealed that 1,717 agencies employed 13,851 non-farm agricultural workers. This employment constituted 3.6 per cent of the employed labor force of West Virginia, which coupled with farm employment of 5.4 per cent of the labor force, gave a total agricultural employment of nine per cent of the labor force.
2) The state ratio of non-farm agricultural workers to the number of commercial farms was found to exist rather generally on an area basis as well.
3) The 13,851 non-farm agricultural workers was distributed into eight categories of employment: 33.2 per cent forestry, 18.1 per cent livestock and poultry industries, 9.7 per cent ornamental horticulture, 6.0 per cent wildlife and recreation, 5.9 per cent produce industry and 4.0 per cent farm service.
4) Employers of non-farm agricultural workers predicted an eight per cent increase in employment in that field within the ensuing five years. The greatest increase was expected in forestry, with an anticipated increase of 13 per cent.
5) All categories of employment, except the produce industries, revealed a significant number of employment opportunities with implications of need for vocational education programs to serve the non-farm sector of the labor force.
6) Based on the data revealed by the study, a post-high school forestry technician pilot program was planned for one geographic area.

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ADULT AGRICULTURE

Davies (1963) tested two hypotheses: 1) that the organization of agriculture is more labor extensive (involving farming in which large areas of land are utilized with minimum outlay and labor) in areas adjacent to cities than it is in areas removed from significant urban development. 2) that changes in the relative labor extensiveness of county agricultural organization during the period 1950-1960 were related to changes in the relative size of county urban population during the same period.

Computing indices of other inputs (other than labor) for use in conjunction with the estimates of labor requirements the first of these hypotheses, tested for the years 1950 and 1960, was accepted; the second hypothesis was rejected. The type of farming (tobacco) may have affected the second hypothesis.

Brown (1964) made a study to determine if the socio-economic values of innovation proneness, economic motivation, rural life preference, and primary group relations were related to the yields of farmers who had either high or low tobacco yields per acre. It was found that high values of innovation proneness and rural life preference were significantly related to high yields per acre of tobacco. High values of economic motivation were not significantly related to high tobacco yields per acre. However, there was a tendency for farmers with high yields to place high values on economic motivation. Primary group relations were not significantly related to tobacco yields per acre, but farmers with high tobacco yields did tend to place lower values on primary group relations. While values on economic motivation and primary group relations were not

significantly related to tobacco yields, they were associated with yields at a level that would warrant some consideration.

A study was undertaken in 1964 to determine factors which seemed to be associated with success in adult farmer education, and to formulate recommendations that have implications for further development of programs in all adult education in Arkansas. (Flood, 1964). Sustained attendance and average number of improved farming practices planned seemed to be adequate criteria for determining success in adult farmer classes. Fifteen factors pertaining to attendance were found to be significant at the .01 level, five factors were significant at the .05 level, and five factors were not associated with attendance. Some of the significant factors were type of class members, number of home visits per member enrolled, time of day classes met, frequency of meetings, type of class organization, method of teaching, place of class meetings, educational level of class members, farming status of class members, tenure of teacher in the school, age of class members, and salary of teacher. Eight factors pertaining to the number of improved farming practices planned by farmers, were significant at the .01 level. Recommendations by the investigator were as follows:

1) Teachers should seek sustained attendance in adult classes rather than large enrollments with unstable attendance.
2) Emphasis on instruction in adult farmer classes should result in members planning and putting into use a number of improved farming practices.
3) The course content for adult classes and methods of teaching should be geared to the educational level and farming status of class members.

4) Adult farmer education should be an integral part of vocational agriculture and teachers should schedule sufficient time during the school day to devote to planning and follow-up and instruction of adult classes.

Whitlock (1961) attempted to ascertain the education of migrant agricultural children. He concluded that:

1) Administrative attitude toward migrant children is varied but is generally favorable.
2) Schools that have placed migrants in integrated classes are more satisfied with their program than those who are not.
3) Fairly regular attendance of migrant children is not a problem with those who "show up." In many cases, school age children simply are not in school. The records and transfers of migrant children are in a very confused state.
4) The facilities and transportation are taxed by the overload of migrant children. Adult education is needed.
5) The literature reveals a need for Federal coordination of education of children of migrant agricultural workers.
6) There is a great need for correlation between the summer programs and the public school programs in the fall.

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